Norman Utilities Authority

2060 Strategic Water Supply Plan

Ad Hoc Committee Meeting

January 10, 2013

Agenda

- Introduction and Goals for Meeting
- Selection of Ad Hoc Committee Chair
- Update on Water Supply Options
  - COMCD report on augmenting Lake Thunderbird
  - Reuse options
  - Existing water supplies – anticipated regulations
- Review Initial List of Water Supply Portfolios
- Upcoming Public Meetings
- Action Items and Next Steps

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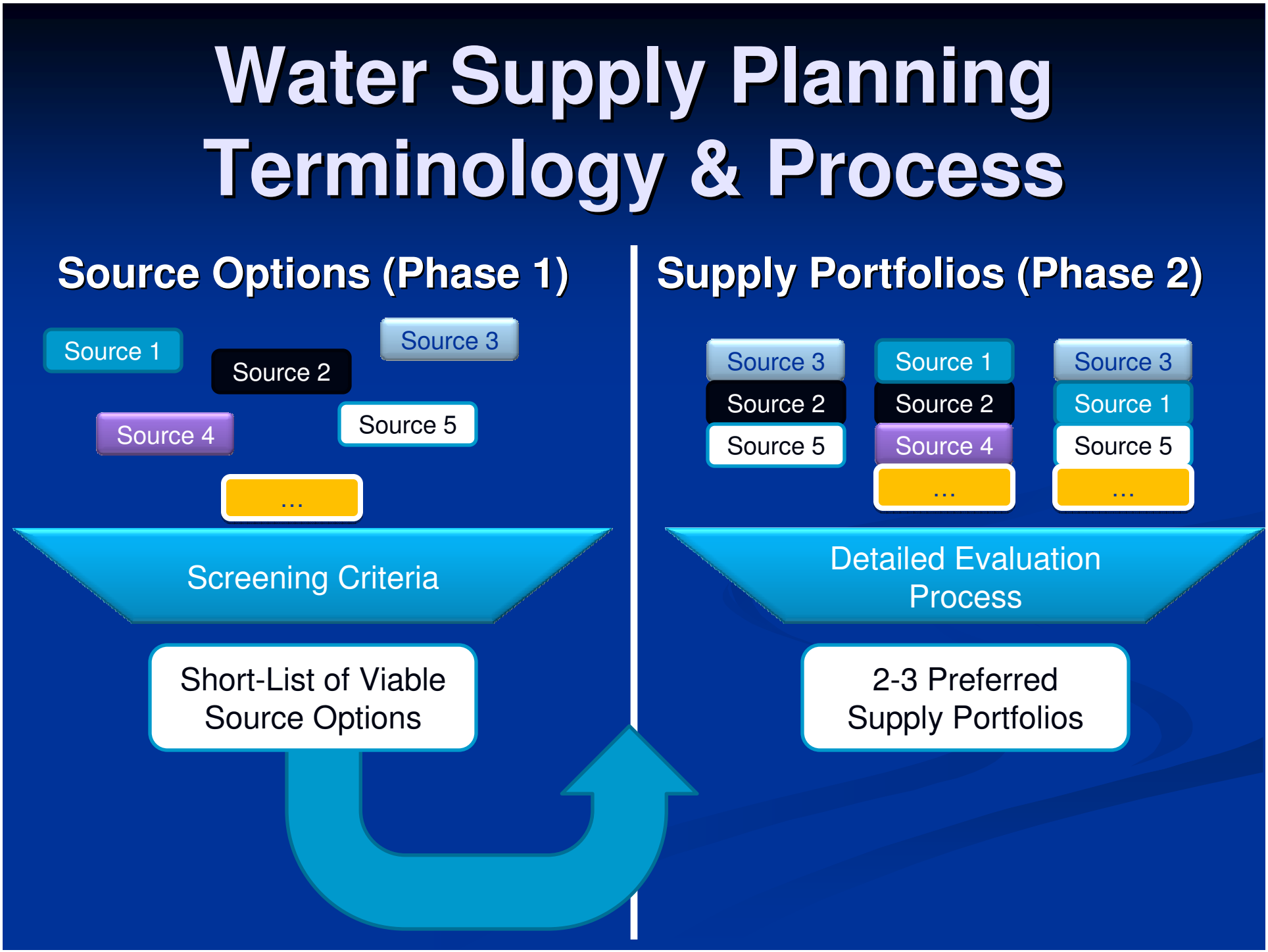
Water Supply Planning Terminology & Process



COMCD Study on Lake Thunderbird Augmentation

- Considered treated wastewater reuse and traditional water supply alternatives for augmenting Lake Thunderbird water supply
- End point = additional raw water supplies (usually in Lake Thunderbird) → Costs are not comparable to SWSP
- Sought 15 mgd of supply in each case

Takeaways from COMCD Study

- Study conclusion: Augmentation with treated effluent is best option
- 15 mgd phased in over time
  - 5 mgd Moore + 10 mgd Norman effluent
  - 15 mgd Norman effluent
  - Requires WWTP upgrades, pipeline, pump stn.
- DEQ indirect potable reuse regs mid-2013
- Significant permitting uncertainties and challenges with Sensitive Water Supply

Indirect Potable Reuse Options

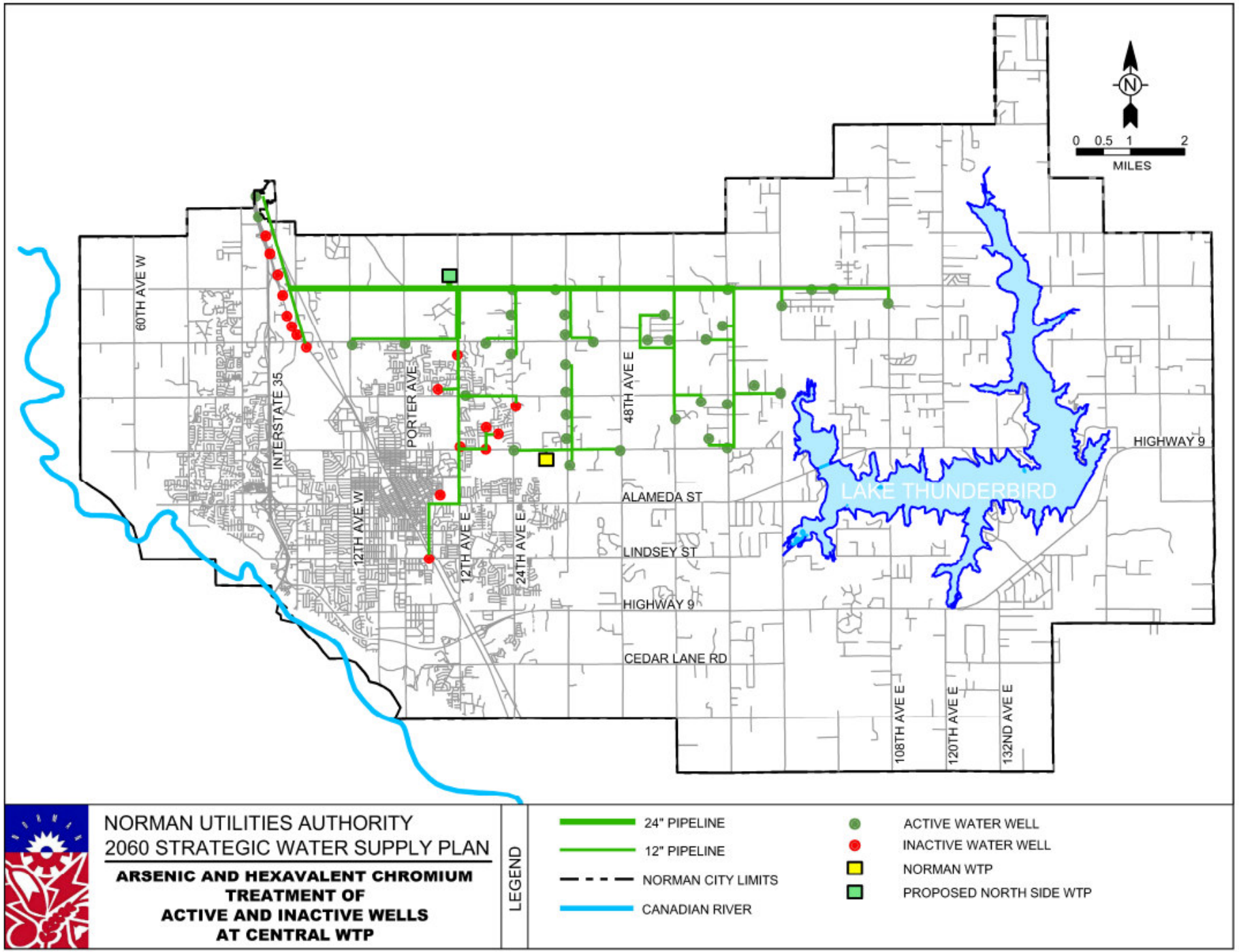
Groundwater Recharge	Lake TB Augmentation
Needs groundwater modeling and feasibility study for quantity and quality	COMCD study completed
Concerns re: mobilize arsenic, chromium-6, other parameters?	Water quality implications understood & treatable
No Oklahoma precedent or regulatory framework	Already occurs in many Oklahoma watersheds (unplanned)
Anticipate extremely stringent treatment, water quality, reliability issues if/when approved	DEQ regulations underway – due July 2013
Estimated unit capital cost: $33,600/AFY	Estimated unit capital cost: $8,300/AFY

Existing Supply Sources

- Lake Thunderbird (without augmentation)
  - Assuming reduction to firm yield of reservoir without wells
  - 6.1 mgd firm yield available to Norman (43.8% of Thunderbird's firm yield)
- Garber-Wellington Aquifer Options
  - Existing active wells – 6.0 mgd average, 7.5 mgd peak
  - Existing inactive wells – 2.1 mgd average, 2.9 mgd peak
  - New wells – assumed 0.17 mgd average, 0.25 mgd peak per new well

Garber-Wellington Treatment Options

- Centralized treatment for chromium-6
  - Chromium-6 regs still uncertain (timing, limits)
  - California likely implementing next year
  - Federal rule possible by ~2016, comply ~2020
- Wellhead treatment for arsenic
  - Wellhead higher unit cost – but treatment targeted to flow that needs arsenic removal
  - Can all wells blended together reliably meet arsenic limits without treatment, under all operating scenarios?
  - Recommendation: Add arsenic treatment at Cr6 WTP if arsenic removal is needed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MILES
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PORTER AVE
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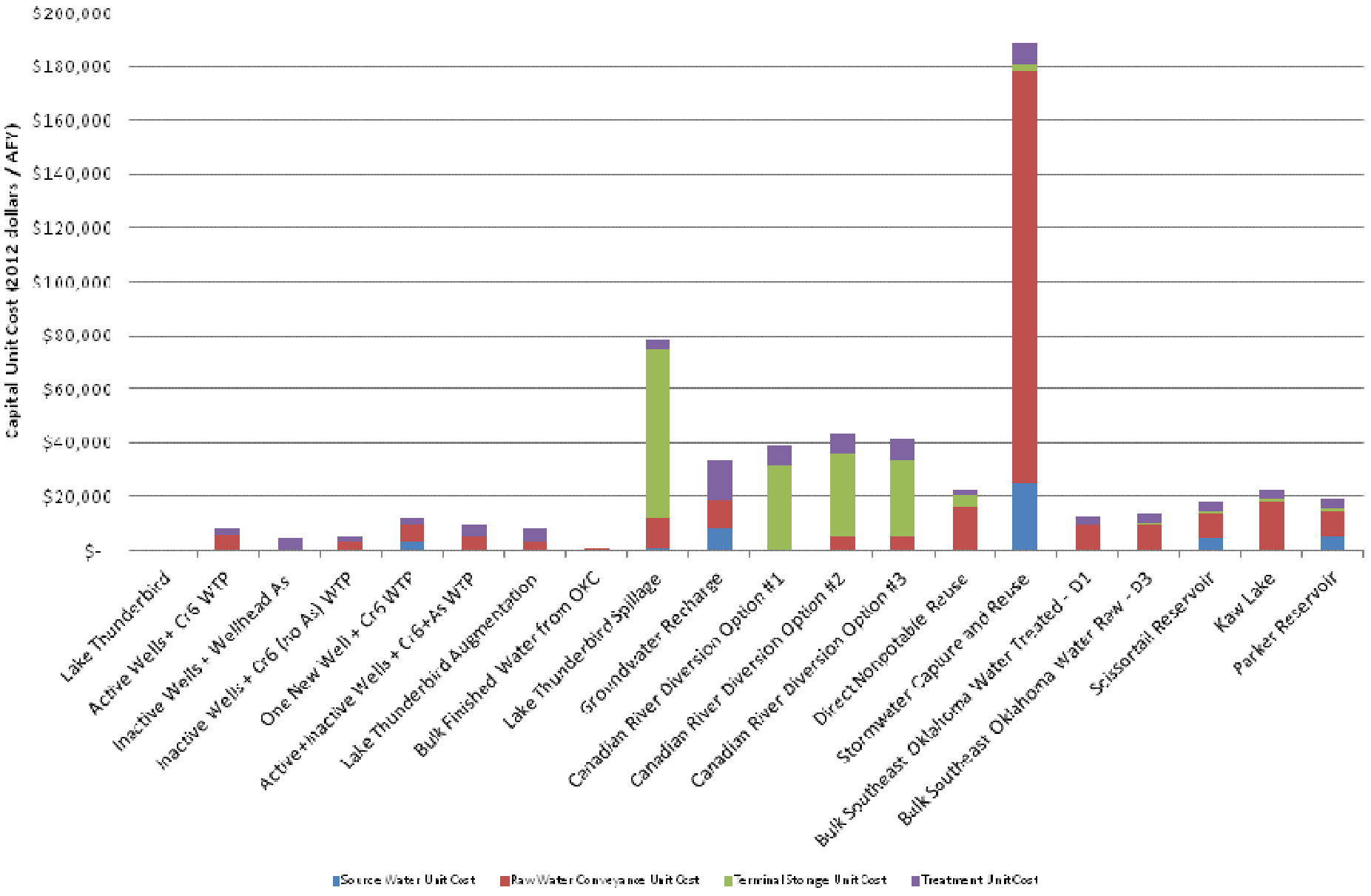
24TH AVE E
48TH AVE E
ALAMEDA ST
LINDSEY ST
HIGHWAY 9
CEDAR LANE RD
LAKE THUNDERBIRD
HIGHWAY 9
108TH AVE E
120TH AVE E
132ND AVE E
NORMAN UTILITIES AUTHORITY
2060 STRATEGIC WATER SUPPLY PLAN
ARSENIC AND HEXAVALENT CHROMIUM TREATMENT OF ACTIVE AND INACTIVE WELLS AT CENTRAL WTP
LEGEND
24" PIPELINE
12" PIPELINE
NORMAN CITY LIMITS
CANADIAN RIVER
ACTIVE WATER WELL
INACTIVE WATER WELL
NORMAN WTP
PROPOSED NORTH SIDE WTP

Capital Unit Cost by Supply Source
based on Firm Yield Available to Norman



Relative Comparison of Individual Source Options

SUPPLY AVAILABILITY

RELIABILITY

CERTAINTY & TIMELINESS

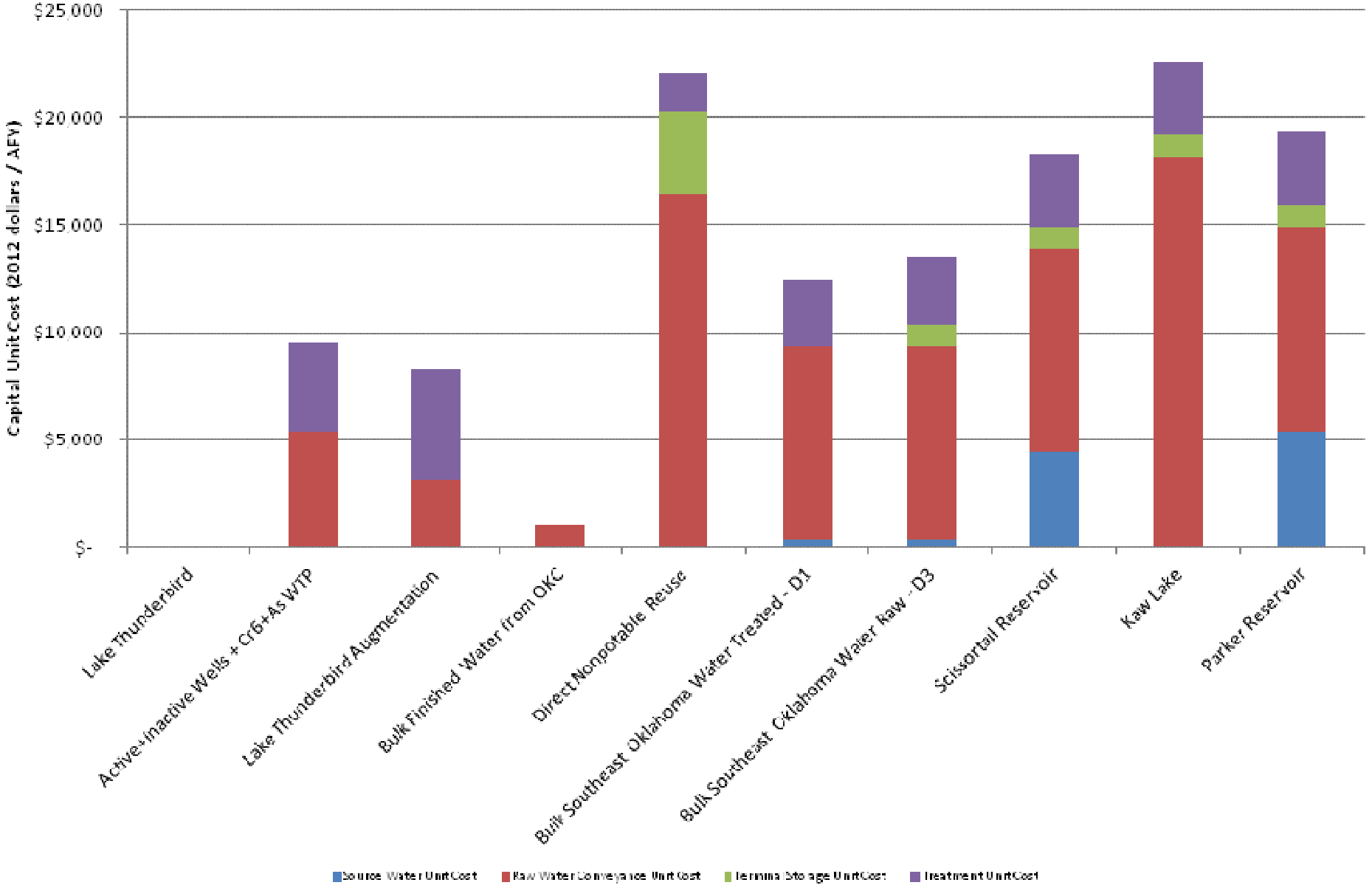
COST-EFFECTIVENESS

- Quantitative (supply avail. & cost)
- Qualitative (reliability & certainty)
  - Scored from 1 (worst) to 5 (best)

Supply Sources Recommended for Portfolio Development

- Existing:
  - Lake Thunderbird
  - Garber-Wellington Aquifer Wells with new treatment
  - Additional conservation
- New Local:
  - Direct non-potable reuse
  - Lake Thunderbird augmentation
- Regional:
  - Bulk treated water from OKC
  - Bulk raw water from OKC
  - New out of basin reservoir
  - Kaw Lake

Capital Unit Cost by Supply Source based on Firm Yield Available to Norman



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Detailed Portfolio Evaluation

Initial "Bookend" Portfolios

Port. 1 | Port. 2 | Port. 3 | Port. 4 | Port. 5 | Port. 6

Detailed Evaluation Criteria → Ranking

Revise & Create Hybrid Portfolios

Port. A | Port. B | Port. C | Port. D

Detailed Evaluation Criteria → Ranking

Final Ranking and Recommendations

Port. C | Port. B | Port. D | Port. A

Criteria for Detailed Evaluations

Objective	Paired Comparison Weighting
Affordability	11.6%
Long-term supply reliability	18.8%
Phasing potential	8.6%
Timely implementation and certainty	15.2%
Efficient use of water resources	17.0%
Environmental stewardship	11.9%
Treated water quality aesthetics	9.8%
Community values (recreation, aesthetics, and property rights)	7.1%
Total	*100%*

Initial Portfolios

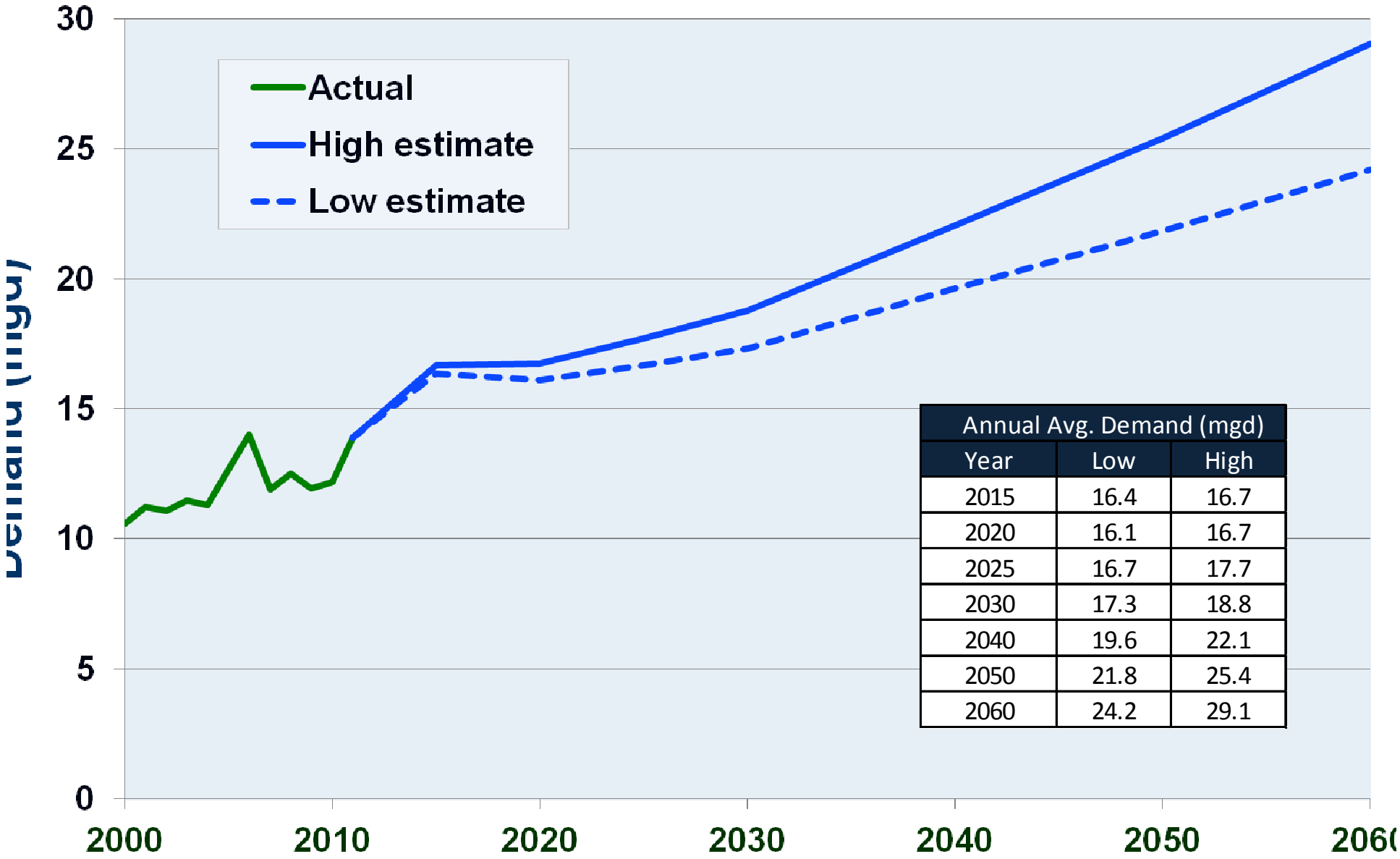
- Portfolio 1: Maximize Local Source Use
  - Lake Thunderbird at baseline yield
  - Existing wells treated for chromium-6 & arsenic
  - Additional conservation + direct non-pot reuse
  - New GW wells to meet remaining deficit through ~2020 (max # wells = twice current)
  - Thunderbird augmentation for deficit post-2020
- Portfolio 2: Low Capital Cost
  - Same as above but no new wells, no Thunderbird augmentation, and fill deficit with OKC Treated ($/kgal)

Initial Portfolios

- Compare “bookend portfolios” for New Regional options
  - Portfolio 3: 100% from OKC Treated
  - Portfolio 4: 100% from OKC Raw
  - Portfolio 5: 100% from New Out of Basin Resv.
  - Portfolio 6: 100% from Kaw Reservoir
- Hybrid Portfolios – TBD
  - Likely a combination of strongest Regional project and strongest Local sources
  - Sensitivity on peaking with infrequent OKC use

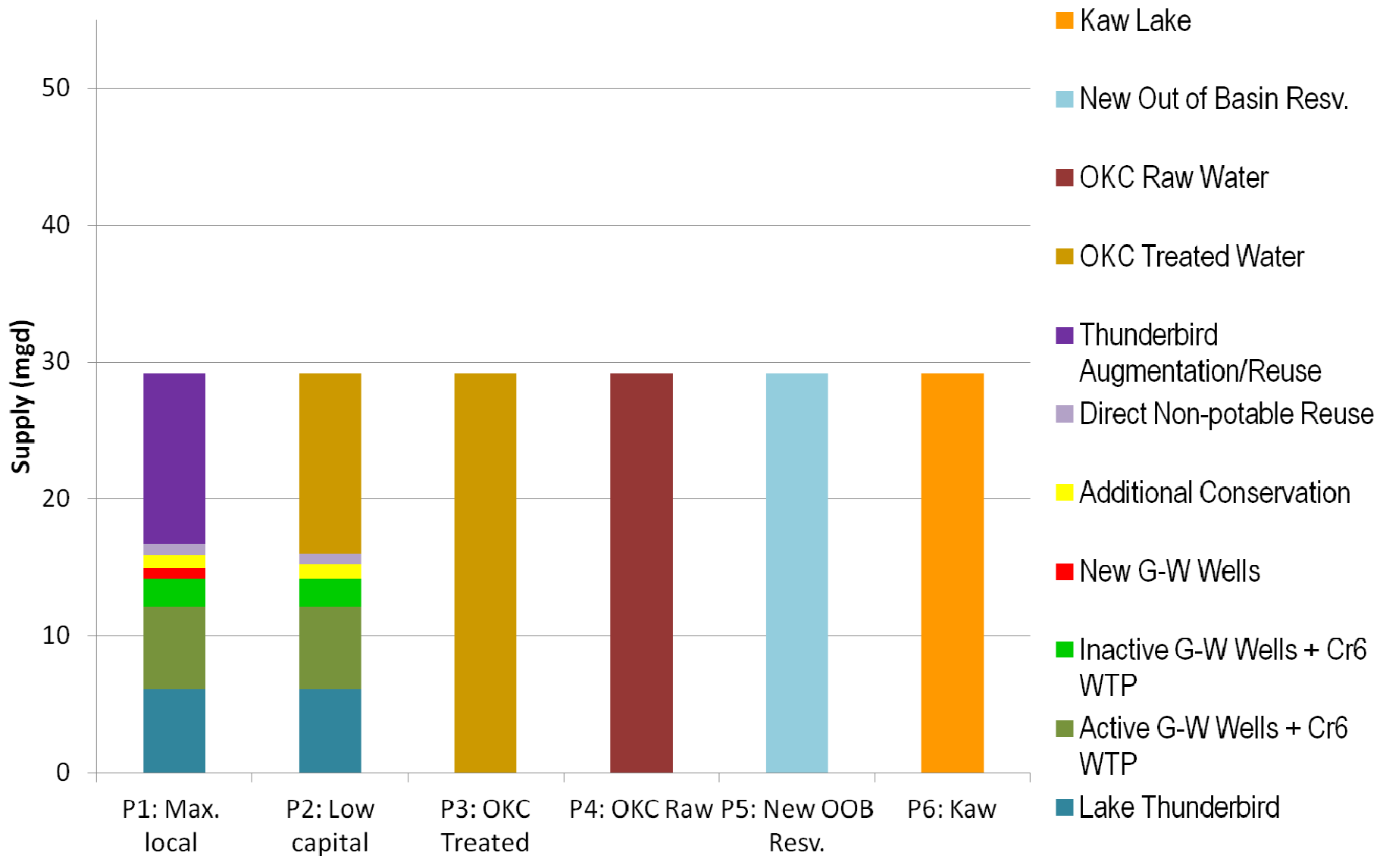
Baseline Demand Projections

Annual average, including reserve and passive conservation

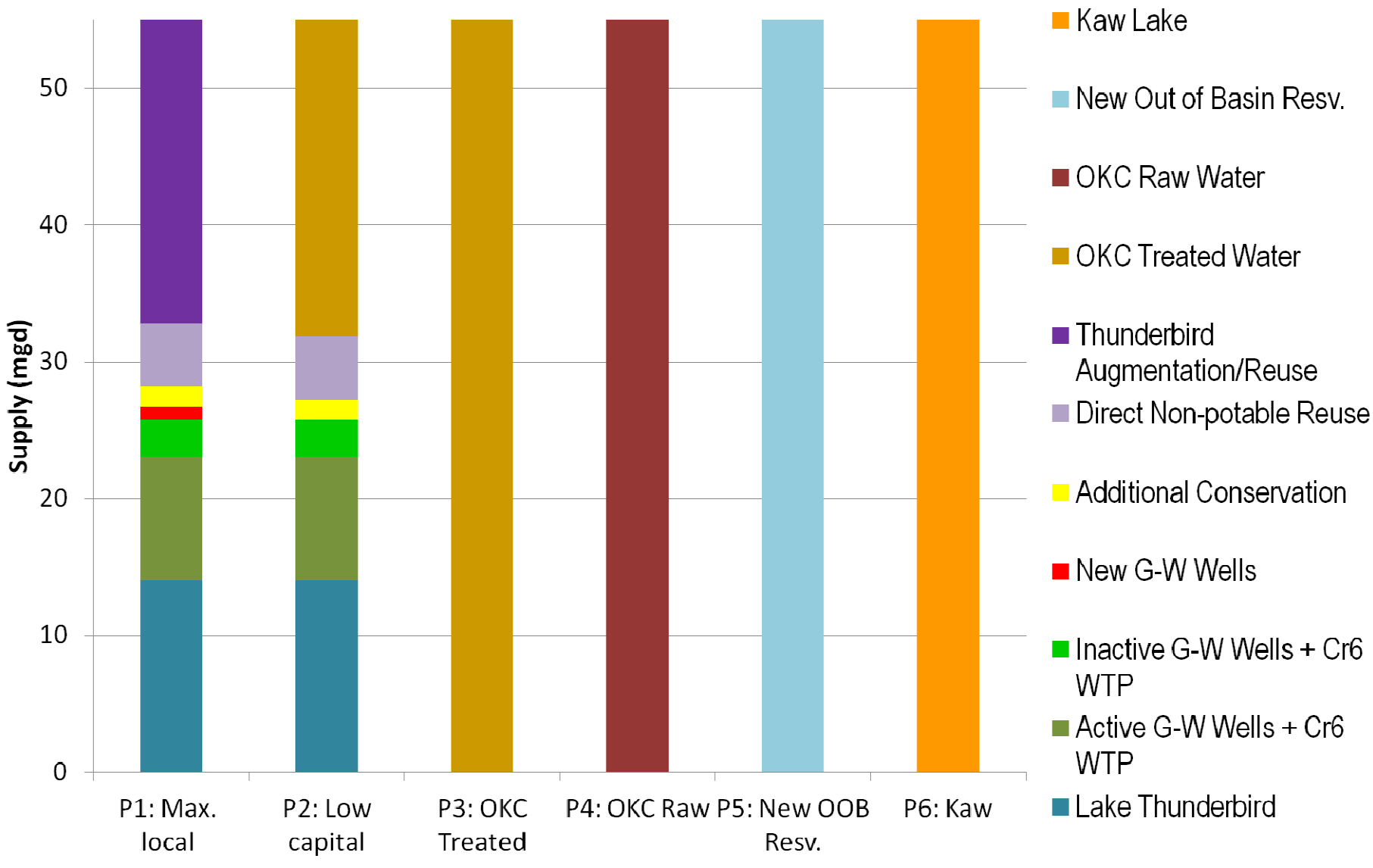


Annual Avg. Demand (mgd)		
Year	Low	High
2015	16.4	16.7
2020	16.1	16.7
2025	16.7	17.7
2030	17.3	18.8
2040	19.6	22.1
2050	21.8	25.4
2060	24.2	29.1

2060 Average Supply



2060 Peak Day Supply



Next Steps for Portfolios and Public Meetings

- Public Meeting 3
- Evaluate 6 preliminary portfolios against all the weighted criteria
- Assess results, develop hybrid portfolios
- Evaluate hybrid portfolios against all the weighted criteria
- Public Meeting 4

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